REVIEW OF ICT CAPACITY OF REGIONAL RIGHTS RESOURCE TEAM

Prepared for
Department for International Development
United Kingdom

and
United Nations Development Programme
Fiji

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SOPAC Miscellaneous Report 454 [RESTRICTED]

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1 EXECUTIVE SUMMARY

The South Pacific Applied Geoscience Commission (SOPAC) was requested to undertake a review of the Regional Rights Resource Team (RRRT) Information and Communication Technology (ICT) needs under a contract with terms of reference included as Attachment A.

The main focus areas, as specified in the terms of reference (TOR) were expanded to:

- Data Server/Web Server
- Website hosting/revamping
- Internet/Intranet connection to UNDP
- E-mail
- Network printing
- Remote access service
- Network cabling system
- Data backup system
- Power backup
- PC workstations
- Virus protection
- Software compliance
- Implementation

Where these also address the more specific areas in the TOR that are:

1. Review the current network system and recommend suitable backbone that will enhance the performance of the network;
2. Review the Internet/Intranet and E-mail system to see if there is need to separate it from the current server;
3. Review the current software applications and Operating Systems and advise if there is a need for any upgrade to handle current systems;
4. Review hardware requirements for each PC workstation, including capacity and specifications;
5. Review the system regarding virus and recommend effective virus control software program;
6. Review network backup system.

A visit was made on Thursday 21 and Friday 22 March 2002 to review these requirements and this report was delivered on Friday 22 March 2002.and is structured as follows. The findings of each specific area are summarised in this section and then followed by an ICT needs overview that highlights the timeliness of the review and identifies the broad areas that need to be addressed. This is then followed by a section on each of the aforementioned expanded requirements. Attachments include the terms of reference, equipment budget, Internet access charges, network diagram, supplier contacts and acronyms.

1.1 Review the current network system and recommend suitable backbone that will enhance the performance of the network

The current network system consists of two 10-BaseT hubs interconnected by a 10-Base2 cable. Structured cabling has been laid in parallel that handles voice and data, terminates in a patch panel and connected to a new PABX. With additional lines and a 24 port 100-BaseT switch the network can be changed over to the new system and the old system removed. The new system will provide significant increase in transfer speed as well as ease of troubleshooting. See Section 9 and Attachment D for further details and Attachment B for detailed costs.

1.2 Review the Internet/Intranet and E-mail system to see if there is need to separate it from the current server

The existing server needs replacing with new unit that new operating system. This will upgrade Exchange Server groupware from 5.5 to 2000 that will serve the e-mail needs of the additional staff. A faster "Corporate" connection is recommended with a connection to UNDP as the next step after UNDP connects to Telecom Fiji Ltd Internet Services. It should be noted that purchasing bandwidth on a shared basis is far more cost effective than individual purchasing. See Sections 4, 5 and 6 and Attachment C for further details and Attachment B for detailed costs.

1.3 Review the current software applications and Operating Systems and advise if there is a need for any upgrade to handle current systems

A new server is needed with Windows Small Business Suite (SBS) 2000. This includes Windows 2000 Server, Exchange 2000 Server, SQL Server 2000 and Internet Security and Acceleration (replaces MS Proxy). Tape backup software and server virus protected are also recommended for the server. Microsoft Office 2000, Microsoft Project 2000 together with Adobe Acrobat 5.0, PageMaker 7.0 and Photoshop 6.0 are recommended for the desktop. SBS also includes FrontPage 2000 for web site development. See Sections 3 and 14 for further details and Attachment B for detailed costs.

1.4 Review hardware requirements for each PC workstation, including capacity and specifications

Nine additional workstations are required to handle the increase in staff numbers. RRRT uses Compaq brand and the new EVO series with P4 1.7GHz CPU, 128MB RAM, 20GB HDD that are networked and have Windows 2000 as the operating system are recommended. See Section 12 for further details and Attachment B for detailed costs.

1.5 Review the system regarding virus and recommend effective virus control software program

There appears to be no formal virus protection system in place and Network Associates Total Virus Defence Suite is recommended that detects and cleans infected files on both server and clients. See Section 13 for further details and Attachment B for detailed costs.

1.6 Review network backup system

The existing backup system is an external single DDS tape that uses Microsoft NT native backup. It is non operational and should be replaced by an external DDS4 autochanger that will handle the increased hard drive capacity of the new server with software that addresses the dynamic files of Exchange Server and SQL Server and provides structured tape rotation for full and incremental backup with minimal user

intervention once setup. See Section 10 for further details and Attachment B for detailed costs.

1.7 Summary of costs

Costs by area are summarised as follows where detailed costs are included in Attachment B.

SUMMARY

		AUD	FJD	USD
Hardware server		14,288	16,655	7,048
Hardware desktop		23,301	27,161	11,495
Hardware printer		2,242	2,613	1,106
Hardware network		720	839	355
Software server		7,714	8,992	3,805
Software desktop		7,045	8,212	3,475
Consumables		4,650	5,420	2,294
		59,961	**69,892**	29,578
Contingency	5%	2,998	3,495	1,479
TOTAL		62,959	**73,387**	31,057

2 ICT NEEDS OVERVIEW

ICT is a necessary and essential tool for an organisation that needs to evolve and serve its clients in an effective and efficient manner and any organisation that does not employ ICT as a core function will not survive in the new millennium.

RRRT is an example of an organisation that has recognised the potential of ICT in requesting this review that is timely due to:

- Expansion of staff from 8 to 15
- Obsolete hardware
- Obsolete software
- Non operational services such as web and backup
- Inadequate Internet access
- Lack of security
- Lack of software licensing compliance
- Need for an implementation, maintenance and development plan

3 DATA SERVER/WEB SERVER

There are currently two servers where one, a Compaq Prosignia 200 named DELPHI-02 with 2.5GB and 1GB hard drives is both obsolete and non operational while the other, a Compaq Proliant 400 named DELPHI with 9.1GB hard drive running Microsoft Windows NT 4.0 is over four years old and has insufficient performance to run the next generation of sever based operating systems and insufficient capacity to meet the current and future needs of the organisation.

The single operational server performs Data, Web, E-mail, Print services and can function as a Remote Access Server (RAS). It should be noted that the Web services are non operational and will be covered in the subsequent section.

A new server should be acquired where the Compaq Proliant 350 series with 640MB SDRAM, 3 x 18GB hard drives connected in a RAID 5 configuration has the correct performance and capacity to serve the organisation's needs during the next 3 years.

This server is upgradeable in performance with an additional processor and additional RAM and upgradeable in capacity with additional drives added to the array. Microsoft Small Business Suite 2000 is the most cost effective and appropriate server based operating system for organisation of this size and includes Windows 2000 Server, Exchange 2000 Server, SQL Server 2000 and Internet Security and Acceleration (ISA). Also included are Outlook 2000 the Exchange client and FrontPage 2000 for website development. Detailed costs for equipment are included in Attachment B.

Recommendation 1: A new server be acquired that can replace the majority of the functions of DELPHI. DELPHI be demoted to a secondary server that can be used for RAS and optionally an intranet. DELPHI-02 be donated to an appropriate organisation for use as parts or restored for training purposes. In addition, appropriate software that is Microsoft Small Business Suite 2000 be purchased and installed.

4 WEBSITE HOSTING/REVAMPING

The website has not been operational since 1999 due to failure of the Web service. This needs restoring as a high priority as it is understood that the RRRT website won an award. The website however will need upgrading to leverage the technologies that have been developed since 1999 where information can be retrieved from databases of documents in PDF.

Recommendation 2: The Web service be restored and the website updated as a high priority. The next step is to upgrade the website where in house capacity should be developed through staff training or recruitment of an ICT professional with website development skills.

The website should be hosted at RRRT until it is developed and then hosted by UNDP or retained at RRRT if sufficient bandwidth is available. Hosting outside of Fiji should be discouraged as this will reduce pressure on TFL to lower costs.

Recommendation 3: The website should be hosted at a site with sufficient bandwidth where this could be UNDP but this decision cannot be made until midyear. Another option that can be explored is co-location at a site such as UNDP or SIDS that are located in USA.

5 INTERNET/INTRANET CONNECTION TO UNDP

The existing connection to the Internet is via a "Corporate" connection to Telecom Fiji Ltd (TFL) where the cost is approx $550 per month This service provides access to a router that is shared by some 16 customers and if there is a 64k pipe allocated to this router then this results in an effective 4k per customer during peak usage. Even with a 128k pipe this represents only 8k per customer. The short-term solution is to seek a faster "Corporate" connection from TFL where it is understood that they are offering "Corporate" access with less users sharing a router where the cost may be some $900 per month. UNDP are planning to transfer from their existing 64k Internet connection via the SITA (international travel agent) network to a 128k link via TFL by mid year. Due to RRRT's future relationship with UNDP it would be logical as well as cost effective for RRRT to connect to the Internet through UNDP using dial-up initially and then considering a leased line at a later date when access speed is needed in excess of 28k. It should be noted that a 64k dedicated link between RRRT and UNDP will cost some $450 per month. See Attachment C for both Internet access and leased line costs.

Recommendation 4: Immediate steps should be taken to increase the effective Internet access speed via TFL and later via UNDP where a monthly cost of $1,000 should be budgeted where this should ideally be the total cost including leased lines used.

6 E-MAIL

E-mail is a component of Microsoft Exchange Server groupware product that is accessed by the user via Microsoft Outlook.

The current system uses Exchange 5.5 Server and Outlook 97 that will be replaced with Exchange 2000 Server and Outlook 2000 where the latter is included in Small Business Server 2000 as well as Office Professional 2000.

Recommendation 5: Purchase and install new server with SBS 2000 to upgrade Exchange Server and purchase and install Office 2000 Professional on desktops to provide Outlook 2000 for enhanced e-mail operations.

7 NETWORK PRINTING

The existing laser printers are:

A. HP LaserJet 4 that is networkable and currently connected to DELPHI via parallel port
B. HP LaserJet 6 that is not networkable but can be shared via a networked desktop
C. HP LaserJet 4000N that is colour and can be networked.

Printer A is some 7 years old and could go end of life at any time as parts are no longer available. Both printer B and C are useful but caution must be exercised in using the colour unit for large colour print jobs as the consumable costs may be higher than using commercial services in Suva. A networked duplex printer is needed and the HP 2200DN has proven to offer excellent value from money for small workgroup printers. See Attachment B for detailed equipment costs.

Recommendation 6: 1 only HP 2200DN printer should be purchased.

8 REMOTE ACCESS SERVICE

Remote Access Service or RAS allows authorised uses to connect to RRRT network via one or more modems connected to a server. It has been proposed under the Network Cabling System section that there are an additional 4 ports in the Server area wired to the Patch panel in the reception area. Additional external lines will be needed that bypass the PABX and allow selected staff to access the network remotely. The normal use will be for access to Exchange Server 2000 via Outlook 2000 for e-mail and other groupware features as well as access folders that the user would have access to when in the office.

Recommendation 7: Purchase and install new server with SBS 2000 to upgrade Exchange Server and purchase and install Office 2000 Professional on desktops and notebooks to provide Outlook 2000 for enhanced e-mail operations.

9 NETWORK CABLING SYSTEM

The current network cabling consists of a 16-port hub and 8-port hub both 10-BaseT interconnected by 10-Base2 (coax) where these provide access to current users at 10 mbps speed. Due to the forthcoming increase in staff, the office has been upgraded in furniture as well as contracting TFL to undertake a complete rewire using CAT5 structured cabling. This system provides voice and data outlets throughout the office

with wiring that terminates in a patch panel in the Reception area. The patch panel has a capacity of 48 sockets of which only 37 are used. Additional outlets are needed as follows where these are illustrated in Attachment D and detailed costs in Attachment B.

- ?? Server area 1 x 4 data
- ?? Server area 1 x 4 direct for existing dial-out and future dial-in modems
- ?? Training area 1 x 2 data

Recommendation 8: TFL be contracted to cable and install additional outlets as specified and a 24-port switch be installed in the patch panel.

10 DATA BACKUP SYSTEM

The existing backup system is a single external DAT unit that is not operational where it may have been DDS (DDS1) with an uncompressed capacity of 4GB. A DDS4 auto-changer should replace this unit. The following table shows capacity in GB by version:

VERSION	NATIVE	COMPRESSED
DDS	4	8
DDS2	8	12
DDS3	12	24
DDS4	20	40

The server employs RAID 5 array with 3 x 18.2 GB drives giving an effective capacity of 36 GB. This capacity with auto-changer is necessary to accommodate the increased storage, that together with ArcServe Backup for SBS as well as ArcServe Tape Library will provide an automated tape backup solution with minimal user intervention for the organisation. See Attachment B for detailed costs.

Recommendation 9: Tape backup hardware and software should be acquired.

11 POWER BACKUP

Colonial that also operates a bank in the same complex owns the building occupied by RRRT. Banks require 24/7 operations and they have installed a backup generator with auto-changeover facilities that will restore mains power after approx 10 seconds of loss. Power is unreliable in Fiji and subject to regular shutdowns due to equipment failures as well as civil unrest. It is therefore necessary to provide all severs and desktop computers with Uninterruptible Power Supplies (UPS). The existing 1KVA unit connected to the operational server should be retained with that server. See Attachment B for detailed costs.

Recommendation 10: UPS units should be acquired for the new server and all workstations.

12 PC WORKSTATIONS

RRRT has already selected name brand workstations and servers for its office operations using Compaq brand that is the hardware of choice for SOPAC Secretariat and its member countries. The current models recommended are Compaq EVO D500 CMT with P4 1.6 GB CPU, 128MB SDRAM, 20GB HDD with CD-ROM and network ready. 17" monitors are the size of choice. 4 only units should include CD-RW for local backup, archiving and distribution of information via CD.

All existing workstations that have a minimum processor such as Pentium II 450MHz can be upgraded to Windows 2000 operating system. However, any workstation that is upgraded to Windows 2000 will need a minimum of 128MB RAM that is currently the smallest module that can be purchased where the cost implication is some FJD 200. It should be noted that RAM prices are currently rising so an analysis should be done

immediately. Workstations that cannot be upgraded should be left as NT or Win9x. See Attachment B for detailed costs where it should be noted that additional memory for existing desktop has not been included as there was insufficient time for a detailed survey due to desktops being disconnected for the current office renovations. Any such cost, however, could be adequately covered under the contingency line item.

Recommendation 11: 9 only Compaq EVO desktops with 17" monitors should be purchased with 4 only with CD-RW units and existing desktops that can be upgraded to Windows 2000 should be done immediately as additional memory my be needed and the cost of memory is currently rising.

13 VIRUS PROTECTION

Organisations need to be continually vigilant against virus intrusion at both server and client level. SOPAC recommends Network Associates Inc. Total Virus Defence Suite that provides updates for 2 years. See Attachment B for detailed costs.

Recommendation 12: Network Associates Inc Total Virus Defence Suite for 10 users with 2 years of upgrades by purchased.

14 SOFTWARE COMPLIANCE

Organisations need to embrace software compliance if they are to follow legal copyright guidelines. SOPAC recommends Microsoft Office 2000 Professional and sees no advantages in migrating to the XP family that needs even more hardware resources such as 256MB RAM. In addition MS Project has been included for 5 users together with core items of the Adobe family. It should be noted that Microsoft products require a minimum of 5 licenses before the media is supplied and Adobe need 20 in some products. That is why there is a mix of licenses-media and boxed products. See Attachment B for detailed costs.

Recommendation 13: Software for desktops be purchased as detailed in Attachment B.

15 IMPLEMENTATION

Procurement of equipment is only one step in the overall process of implementation and RRRT should consider contracting experienced implementers as well as exploring a maintenance program. Other alternatives are the recruitment of an ICT specialist. SOPAC for example can undertake implementation at USD 300 per day and maintenance programs at USD 300 per month where the latter include development.

Recommendation 14: Implementation and maintenance (development) contracts should be considered.

16 SUMMARY OF RECOMMENDATIONS

Recommendation 1: A new server be acquired that can replace the majority of the functions of DELPHI. DELPHI be demoted to a secondary server that can be used for RAS and optionally an intranet. DELPHI-02 be donated to an appropriate organisation for use as parts or restored for training purposes. In addition, appropriate software that is Microsoft Small Business Suite 2000 be purchased and installed.

Recommendation 2: The Web service be restored and the website updated as a high priority. The next step is to upgrade the website where in house capacity should be developed through staff training or recruitment of an ICT professional with website development skills.

Recommendation 3: The website should be hosted at a site with sufficient bandwidth where this could be UNDP but this decision cannot be made until midyear. Another option that can be explored is co-location at a site such as UNDP or SIDS that are located in USA.

Recommendation 4: Immediate steps should be taken to increase the effective Internet access speed via TFL and later via UNDP where a monthly cost of $1,000 should be budgeted where this should ideally be the total cost including leased lines used.

Recommendation 5: Purchase and install new server with SBS 2000 to upgrade Exchange Server and purchase and install Office 2000 Professional on desktops to provide Outlook 2000 for enhanced e-mail operations.

Recommendation 6: 1 only HP 2200DN printer should be purchased.

Recommendation 7: Purchase and install new server with SBS 2000 to upgrade Exchange Server and purchase and install Office 2000 Professional on desktops and notebooks to provide Outlook 2000 for enhanced e-mail operations.

Recommendation 8: TFL be contracted to cable and install additional outlets as specified and a 24-port switch be installed in the patch panel.

Recommendation 9: Tape backup hardware and software should be acquired.

Recommendation 10: UPS units should be acquired for the new server and all workstations.

Recommendation 11: 9 only Compaq EVO desktops with 17" monitors should be purchased with 4 only with CD-RW units and existing desktops that can be upgraded to Windows 2000 should be done immediately as additional memory my be needed and the cost of memory is currently rising.

Recommendation 12: Network Associates Inc Total Virus Defence Suite for 10 users with 2 years of upgrades by purchased.

Recommendation 13: Software for desktops be purchased as detailed in Attachment B.

Recommendation 14: Implementation and maintenance (development) contracts should be considered.

ATTACHMENT A – TERMS OF REFERENCE

TERMS OF REFERENCE/SCOPE OF WORK

BACKGROUND

RRRT is a regional human rights education project fully funded by the UK Department for International Development (DFID).

OBJECTIVES OF STUDY/CONTRACT

The consultancy is aimed at evaluating the current IT environment and make recommendations to enable efficient performance of the RRRT Office network system.

The general areas of concern are as follows:

- Data Server/Web Server;
- Website hosting/revamping
- Internet/Intranet connection to UNDP;
- E-mail;
- Network printing;
- Remote access service;
- Network cabling system;
- Data backup system;
- Power backups
- PC workstations

SPECIFIC TASKS/OUTPUTS

In particular, the study, will:

1. Review the current network system and recommend suitable backbone that will enhance the performance of the network;
2. Review the Internet/Intranet and E-mail system to see if there is need to separate it from the current server;
3. Review the current software applications and Operating Systems and advise if there is a need for any upgrade to handle current systems;
4. Review hardware requirements for each PC workstation, including capacity and specifications;
5. Review the system regarding virus and recommend effective virus control software program;
6. Review network backup system.

The above consultancy will be for 1-day duration at USD400 per day to be paid to South Pacific Applied Geoscience Commission (SOPAC). The full report will be due no more than two days after the review.

The consultant will work closely with Kylie Parker and Leonard Chan from RRRT.

The consultant will provide a report on the findings and recommendations to RRRT and UNDP.

ATTACHMENT B – EQUIPMENT BUDGET

REGIONAL RIGHTS RESOURCE TEAM					22-Mar-2002
PROPOSED ICT EQUIPMENT					
NO.	ITEM		PART NO.	UNIT FJD	TOTAL FJD
HARDWARE SERVER					
1	Compaq ProLiant ML350G2 P1133	CO	236868-011	3,880.00	3,880.00
	1 x Pentium III 1133MHz processor, 256kb cache				
	Dual processor capable, 133MHz system bus				
	128MB ECC SDRAM (4GB max)				
	3.5" 1.44MB floppy drive, High speed CD				
	6 x 1" Wide-Ultra2 hot plug drive bays				
	64bit and 32bit PCI slots				
	Embedded NC3163 10/100 NIC with WOL				
1	512MB ECC 133MHz SDRAM (1x512)	CO	128279-B21	1,042.00	1,042.00
1	Smart Array 532 Controller	CO	225338-B21	1,516.00	1,516.00
4	18.2GB Pluggable Ultra3 Universal 10K	CO	142673-B22	757.00	3,028.00
1	20/40GB External DAT DDS-4 8 Autoloader	CO	166505-B31	5,626.00	5,626.00
1	S720 17" Value Monitor - 2 Tone	CO	238993-011	426.00	426.00
1	Compaq UPS T1000 XR 1KVA	CO	204155-B21	1,137.00	1,137.00
HARDWARE DESKTOP					
9	EVO D500 CMT 1.6GHz/20GB/128MB/CDS(W2K)	CO	470024-177	2,055.00	18,495.00
	Pentium 4 1.6GHz, Intel 845 Chipset				
	128MB SDRAM-3 slots, 20GB(7200rpm)HDD				
	NVIDIA Vanta 16-MB 4X AGP, Intel PRO/100 NIC				
	48X CD-ROM, AC97 Audio,Int Speaker				
	Easy Keyboard, Scroll Mouse				
	Win 2000/XP Dual Install				
	3 Yrs Warranty				
9	S720 17" Value Monitor - 2 Tone	CO	238993-011	426.00	3,834.00
4	Compaq 16X/10X/40X CD-RW Drive (Carbon)	CO	240598-B22	299.00	1,196.00
9	Compaq UPS Model Pro 500VA	CO	136386-B31	379.00	3,411.00
9	6 outlet power boards with spike suppression	CO		25.00	225.00
HARDWARE PRINTER					
1	HP Laserjet 2200DN Printer	CO	HPL7063	2,613.00	2,613.00
HARDWARE NETWORK					
1	24 Port 10/100 switch rack mounted	CO	HUB-SW3124R	839.00	839.00
SOFTWARE SERVER					
1	MSOEM 1PK SMALL BUSINESS SERVER 2K	CO	OEM1714	2,796.00	2,796.00
	WIN2K SVR, EXCHANGE2K SVR, SQL2K SVR				
	Including 5 CD's and 129 page manual + 5 CALS				
2	MS SBS 2000 5 CAL PACK 3.5 DMF		MSS9681	773.00	1,546.00
	Microsoft Small Business Server 2000				
	5 CAL License pack				
1	BrightStor ARCserve Backup for SBS	CO	CHY9661	1,251.00	1,251.00
1	BrightStor ArcServe 2000 AE Tape Library option	CO		1,777.00	1,777.00
1	Network Assoc Inc Total Virus Defense 10 users 2 yr	CO	MCL9022	1,122.00	1,122.00
1	DameWare control			500.00	500.00

SOFTWARE DESKTOP					
1	MS Office Pro 2000 Media	PS		185.00	185.00
15	Office XP Pro Win32 English OLP NL AE	PS		174.61	2,619.21
1	MS Project 2000 Media	PS		185.00	185.00
5	Project 2000 Win32 English OLP NL AE	PS		138.60	693.00
10	Adobe Acrobat 5.0 AE boxed	PS		152.00	1,520.00
2	Adobe PageMaker 7.0 AE boxed	PS		743.00	1,486.00
2	Adobe Photoshop 6.0 AE boxed	PS		762.00	1,524.00
CONSUMABLES					
5	20/40GB DDS-4 DAT Cartridge (10 Pack)	CO	152842-001	700.00	3,500.00
5	DDS Cleaning tape	CO		20.00	100.00
5	HP Toner for 2100/2200	CO	C4096A	220.00	1,100.00
30	CD-RW 700MB	CO		4.00	120.00
400	CD-R 80min 700MB	CO		1.50	600.00
					69,892.21
SUMMARY					
			AUD	FJD	USD
	Hardware server		14,288	16,655	7,048
	Hardware desktop		23,301	27,161	11,495
	Hardware printer		2,242	2,613	1,106
	Hardware network		720	839	355
	Software server		7,714	8,992	3,805
	Software desktop		7,045	8,212	3,475
	Consumables		4,650	5,420	2,294
			59,961	**69,892**	29,578
	Contingency	5%	2,998	3,495	1,479
	TOTAL		62,959	**73,387**	31,057
SUPPLIER CODES					
CO	Compaq, Fiji				
PS	Pacsoft, Fiji				
NOTES					
A	All items VAT and duty free				
B	All desktop software educational discount				
EXCHANGE RATES - 20 MAR 2002					
	1 FJD =		0.8579	AUD	
	1 FJD =		0.4232	USD	

ATTACHMENT C – INTERNET ACCESS CHARGES

New Internet Access Prices

Comparison of New Prices relative to Current Price

Dial Up Prices

	Monthly Charge			Excess Usage Rate Per Hour		
Product	**Current Price**	**New Price**	**Reduction**	**Current Price**	**New Price**	**Reduction**
Individual Dial Up	$22.00	$14.95	32%	$6.60	$5.28	20%
Netsaver 3 (3 hours	$19.80	$14.95	24%	$6.16	$4.93	20%
Netsaver 15 (15 hours	$77.00	$49.95	35%	$6.16	$4.93	20%
Netsaver 25 (25 hours	$121.00	$74.95	38 %	$6.16	$4.93	20%
Netsaver 40 (40 hours	$176.00	$109.95	38%	$6.16	$4.93	20%
NetSaver Super*	$55.00	$49.50	10%	N/A	N/A	N/A

Fixed Corporate On-line Prices

9.6	$2,486	$1,999	-20%
19.2	$3,542	$2,599	-27%
48.0	$6,292	$3,499	-44%
64.0	$8,393	$3,999	-52%
128.0	$16,467	$7,699	-53%
192.0	$23,474	$10,999	-51%
256.0	$30,195	$14,500	-52%
384.0	None	$21,500	
512.0	None	$27,500	
768.0	None	$39,500	
1,024.0	None	$50,500	
1,536.0	None	$72,500	
2,048.0	None	$85,500	

Volume Based On-line Prices

	Monthly Charge			Volume Usage Rate per MByte		
Access Speed (kbps)	**Current Price**	**New Price**	**Benefits**	Current Price	**New Price**	**Reduction %**
9.6k	$730	$730	New prices include 200Mbytes of volume	88c	66c	25%
19.2k	$880	$880		88c	66c	25%
48k	$990	$990		88c	66c	25%
64k	$1,100	$1,100		88c	66c	25%
128k	$1,200	$1,200		88c	66c	25%

		Monthly Charge			Excess Usage Rate per MByte		
	Access Speed (kbps)	Current Price	**New Price**	**Reduction %**	Current Price	**New Price**	**Reduction %**
Includes 2GByte	64k	$2,460	$1,980	24%	82.5c	66c	20%
	128k	$2,860	$2,200	30%	82.5c	66c	20%
Includes 5Gbyte	64k	$4,675	$3,850	21%	82.5c	66c	20%
	128k	$4,875	$4,070	20%	82.5c	66c	20%

Dial Up Access

Internet Service's Dial Up connection will give you access to the Internet through a telephone line so you can send and receive emails, browse the World Wide Web (WWW), download/transfer computer files and use news groups.

Are You:

- ?? Home user
- ?? Small business
- ?? Corporation
- ?? Educational Institution
- ?? Government Organization

.....then **Internet Services** has a Dial Up Internet solution for you !

Whether you are Home user wanting access Internet for Education, Email, Entertainment, Fun or a Business user wanting to access information Stock Markets, Financial Reviews, Research on new Products, Services, Suppliers and Wholesalers or to transfer data and files. Internet Services has a Dial Up Plan suiting your Internet needs. You can choose from our range of Dial Up Plans:

Old

Internet Services Plan	Setup Fee	Monthly Fee	Hours included per Month	Excess Usage (over 3 hours)
NetSaver3	$110	$19.80	3	$6.16 per hour
NetSaver15	$110	$77.00	15	$6.16 per hour
NetSaver25	$110	$121.00	25	$6.16 per hour
NetSaver40	$110	$176.00	40	$6.16 per hour
Internet Services Plan	**Setup**	**Monthly Fee**	**Hours included per Month**	
NetSaversuper	$110	$55.00	Unlimited Usage	

New

Internet Services Plan	Setup Fee	Monthly Fee	Hours included per Month	Excess Usage (over 3 hours)
NetSaver3	$110	$14.95	3	$4.93 per hour
NetSaver15	$110	$49.95	15	$4.93 per hour
NetSaver25	$110	$74.95	25	$4.93 per hour
NetSaver40	$110	$109.95	40	$4.93 per hour
Internet Services Plan	**Setup**	**Monthly Fee**	**Hours included per Month**	
NetSaversuper	$110	$49.50	Unlimited Usage	

Areas Dial Up Plans Available in Fiji
View areas where Internet Services Dial Up Plans are available in Fiji.
Email Access from Anywhere
Going overseas on a business trip or holiday and need to check your e-mails? Are you always on the move and need to check your e-mails from wherever you are? We have a solution! You can check your emails from anywhere in the world from any PC with Internet access with our **Webmail**

Customer Service
Whether you need further information about our Dial Up Plans, need information on billing, need assistance for your Internet account with a problem you are having. Contact our **Friendly** and **Helpful** staff of Customer Service Officers and Technical Officers available to assist you from: **8:00am - 4:30pm** - **Monday - Friday** and **8:00am - 4:00pm - Friday on Ph: (679) 300100, Fax: (679) 307237**

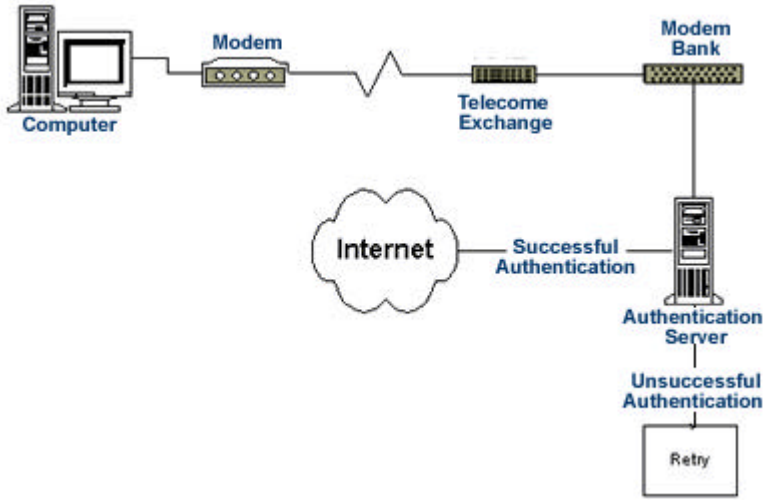
Online Support:
If you have an Internet Services Dial Up account and are looking for help regarding your Internet account visit our **Support Site** or simply contact us via email for respective area of service.

General Enquiry	**Customer Service**	**Technical Support**

What Equipment Do I Need?

- Personal Computer with minimum of 486(50Mhz) processor or faster, with at least 16MB of RAM. Your computer can either be a Macintosh or an IBM Compatible with Windows 3.x, Windows 95/98 or OS2.
- Dial Up Modem with minimum speed of 28.8kbps
- Direct telephone Line

Internet Access - Route Diagram



Casual Access
Telecom Fiji also provides an Internet Bureau for locals and overseas travelers. Usage is charged on a per minute basis, and is payable in full at the end of each user session. The Internet Bureau is located at: Telecom Customer Care Centre, Ground Floor, Ganilau House, corner of Thompson and Edward Street, Suva. For further information you may contact the Internet Bureau on telephone number **(679) 311342.**

Dial Up Configuration Summary

The Dial Up Configuration Summary lists all the configuration details necessary to connect to the Internet Services Dial Up Plans. You can also check your Dial Up Plan Access telephone numbers.

Corporate Access

Please note that fees provided below include the installation and monthly rental charges of leased lines (where needed). All fees given below are subject to confirmation as cost may vary depending on the location of Digital Data Services nodes and if installation is to be carried outside of Suva.

Shared Corporate (Dedicated Dialup)

This service allows an individual or corporate organisation full Internet access. The service provides a Dialup PPP connection, to a hub where it shares a connection to the Internet, with other organisations. Non-profit organisations and schools receive a discounted monthly rental fee. To initiate the connection, a call needs to be made to the nearest Internet exchange. Standard telephone (local) charges apply when dialling into this service. 'Dedicated Dialup' nodes are available in Suva, Lautoka, Nadi, Labasa and Tailevu.

Old

Installation Fee	**$220.00 (Suva Only - Outside Suva on application)**
Monthly Rental	**$495.00 (Others) $330 (Schools)**
Online Usage	**NIL**

New

Installation Fee	**$220.00 (Telecome Fiji end only)**
Monthly Rental	**$880.00 (Others) $550.00 (Schools)**
Online Usage	**NIL**

Volume Based

This service allows an individual or corporate organisation full Internet access. The service is made available through a leased line between your office and our node. The cost involves a monthly data lease line fee and Internet port fee (both depending on line speed) plus a usage fee depending the amount of data transferred over the link. Monthly rates may differ if the location of your office falls outside of Digital Data Services step '**L**' nodes.

This service allows an individual or corporate organisation full Internet access. The service is made available through a leased line between your office and our node. The fee consitis of a fixed Internet port with 200Mb data usage and excess data transfer with the charged amount.

Old

Volume Charges are as follows:

Service	Installation(vip)	Data Lease Line Fee (L)	Internet Port Fee	Usage(vip)
Volume Base Corporate	$770.00	[9.6kbps]	$770.00	
	$770.00	[19.2kbps]	$880.00	
	$770.00	[48.0kbps]	$990.00	
	$770.00	[64.0kbps]	$1,100.00	
				International Traffic **$0.88/MB [1-2000MB]** **$0.825MB [>2GB]**

New

Service	Installation(vip)	Data Lease Line speed	Internet Port Fee	Usage(vip)
Volume Base Corporate	$770.00	[9.6kbps]	$803.00	**$0.66/MB**
	$770.00	[19.2kbps]	$880.00	
	$770.00	[48.0kbps]	$880.00	
	$770.00	[64.0kbps]	$1,100.00	
		[128.0kbps]	$1,320.00	

Dedicated Corporate

This service allows an individual or corporate organisation full Internet access. The service is made available through a leased line between your office and our node. The connection is also monitored on a 24 hour basis by Internet Services engineers. The cost involves a fixed monthly fee (depending on line speed) with no usage fees. The monthly and installation fees include the cost of leased line. Monthly rates may differ if the location of your office falls outside of Digital Data Services step '**L**' nodes.

Old

Service	Installation(vip)	Data Lease Line Fee (L)	Internet Fee	Usage(vip)
Dedicated Corporate	$770.00	9.6kbps	$2,486.00	Nil
	$770.00	19.2kbps	$3,542.00	
	$770.00	48.0kbps	$6,292.00	
	$770.00	64.0kbps	$8,393.00	
Internet	$770.00	128.0kbps	$16,467.00	
	$770.00	192.0kbps	$23,474.00	
	$770.00	256.0kbps	$30,195.00	

New

Service	Installation(vip)	Data Lease Line Fee (L)	Internet Fee	Usage(vip)
Dedicated Corporate	$770.00	9.6kbps	$1,999.00	Nil
	$770.00	19.2kbps	$2,599.00	
	$770.00	48.0kbps	$3,499.00	
	$770.00	64.0kbps	$3,999.00	
Internet	$770.00	128.0kbps	$7,699.00	
	$770.00	192.0kbps	$10,999.00	
	$770.00	256.0kbps	$14,500.00	
	$770.00	384.0kbps	$21,500.00	

?? **- Includes Data Lease Line Installation Fee**

Digital Data Services
Tariff Brochure

Private Leased Circuit and Frame Relay Tariff Brochure

Section 1 - Price Components

There are three core components of the DDS monthly charges for Private Leased Circuits and Frame Relay Circuits. These are:

- Installation Charges
- Network Access Charges
- Data Transmission Charges

1.1 Installation Charges

A once-off installation is charged for the connection of each access to the Telecom Fiji Data Network. The new installation charges for Private Leased Circuits (PLC) – DataLink (speeds ≤ 64k), SuperLink (64k < speed < 2Megs), MegaLink (speeds ≥ 2 Megs) and Frame Relay Circuits (FR) are as follows:

Speed (kbps)	Once-Off Installation (VEP)	
	Private Leased Circuits	Frame Relay Circuits
≤ 64	$400	$450
128 – 1536	$500	$600
> 1536	$600	$800
All speeds	Permanent Virtual Circuits	$100

Table 1 – Installation Charges per Access for PLC and FR and per transmission (PVC) for Frame Relay

1.2 Access Charges

The access charge is for the connection between the nearest Telecom Fiji's Data Network (DDN) and customer premises. A Private Leased Circuit has 2 access points and Frame Relay circuit has one access point into the DDN. The new access charges for Private Leased Circuit and Frame Relay are as follows:

Speed (kbps)	Per Access Charge Per Month (VEP)	
	Private Leased Circuits	Frame Relay Circuits
9.6	$180	
19.2	$180	
48	$200	
64	$200	$285
128	$210	$420
256	$250	$630
384	$300	$910
512	$350	$1,050
768	$400	$1,100
1024	$450	$1,400
1536	$550	$1,700
2048	$650	$2,000

Table 2 – Access Charges for PLC and FR

1.3 Transmission Charges

Charges for data transmission between DDN depend on two variables – speed and distance. Transmission steps are based on distance and broken down into four steps – L (Local), A, B and C. Step L occurs when transmission is confined within the same exchange e.g. Samabula-Samabula. The transmission step categorises the relative distances between the major urban centres as follows:

Urban Centre	Ba	Colo-i-suva	Deuba	Fintel	Labasa	Lami	Lautoka	Levuka	Nadi	Nakasi	Namaka	Nasinu	Nausori	Navua	Rakiraki	Samabula	Savusavu	Sigatoka	Suva	Tavua	Waiyevo
Ba	L																				
Colo-i-suva	C	L																			
Deuba	C	B	L																		
Fintel	C	A	B	L																	
Labasa	C	C	C	C	L																
Lami	C	B	B	A	C	L															
Lautoka	B	C	C	C	C	C	L														
Levuka	C	B	C	B	C	C	C	L													
Nadi	B	C	C	C	C	C	B	C	L												
Nakasi	C	B	B	B	C	B	C	B	C	L											
Namaka	B	C	C	C	C	C	B	C	A	C	L										
Nasinu	C	B	B	B	C	B	C	B	C	A	C	L									
Nausori	C	B	B	B	C	B	C	B	C	A	C	A	L								
Navua	C	B	A	B	C	B	C	C	C	B	C	B	B	L							
Rakiraki	B	C	C	C	B	C	B	B	C	C	C	C	C	C	L						
Samabula	C	A	B	A	C	A	C	B	C	B	C	B	B	B	C	L					
Savusavu	C	C	C	C	B	C	C	C	C	C	C	C	C	C	C	C	L				
Sigatoka	B	C	B	C	C	C	B	C	B	C	B	C	C	B	C	C	C	L			
Suva	C	A	B	A	C	A	C	B	C	B	C	B	B	B	C	A	C	C	L		
Tavua	B	C	C	C	C	C	B	C	B	C	B	C	C	C	B	C	C	C	C	L	
Waiyevo	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	C	L

Table 3 – Transmission Steps

1.3.1 Transmission Table for Private Leased Circuits

The transmission component of Private Leased Circuit is dependent on the speed and distance:

Speed (kbps)	Transmission Charges per Month per Step (VEP)			
	L	A	B	C
9.6	$8	$30	$150	$470
19.2	$15	$45	$230	$670
48	$20	$90	$460	$1,270
64	$25	$110	$600	$1,610
128	$20	$145	$780	$1,870
256	$30	$215	$1,140	$2,380
384	$37	$280	$1,500	$2,890
512	$45	$350	$1,870	$3,400
768	$55	$480	$2,590	$4,420
1024	$65	$620	$3,320	$5,440
1536	$80	$860	$4,610	$7,070
2048	$100	$1,100	$5,900	$8,700

Table 4 – Transmission Table for PLC

1.3.2 Transmission Table for Frame Relay Circuits

Permanent Virtual Circuits (PVC) make up the transmission component of Frame Relay . The PVC price is dependent on the speed of the connection and the distance.

Speed (kbps)	PVC Transmission Charges per Month per Step (VEP)			
	L	A	B	C
8	$16	$42	$283	$565
16	$24	$56	$377	$754
24	$32	$70	$471	$942
32	$40	$84	$565	$1,130
40	$47	$98	$659	$1,319
48	$55	$112	$754	$1,507
56	$63	$126	$848	$1,696
64	$70	$140	$942	$1,884
128	$109	$218	$1,320	$2,640
256	$146	$292	$1,680	$3,360
384	$195	$390	$2,160	$4,320
512	$220	$439	$2,400	$4,800
768	$257	$513	$2,760	$5,520
1024	$281	$563	$3,000	$6,000
1536	$391	$781	$4,000	$8,000
2048	$500	$1,000	$5,000	$10,000

Table 5 – Transmission Table for FR

Section 2 - Tabulated Monthly Rentals for Private Leased Circuits

The access and transmission charges have been added to determine the total monthly rental per speed per step for private leased circuits.

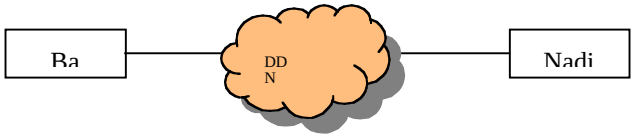
Speed (kbps)	New Monthly Rentals for PLC (VEP)			
	L	A	B	C
9.6	$368	$390	$510	$830
19.2	$375	$405	$590	$1,030
48	$420	$490	$860	$1,670
64	$425	$510	$1,000	$2,010
128	$440	$565	$1,200	$2,290
256	$530	$715	$1,640	$2,880
384	$637	$880	$2,100	$3,490
512	$745	$1,050	$2,570	$4,100
768	$855	$1,280	$3,390	$5,220
1024	$965	$1,520	$4,220	$6,340
1536	$1,180	$1,960	$5,710	$8,170
2048	$1,400	$2,400	$7,200	$10,000

Table 6 – Tabulated Monthly Rentals for PLC

Total monthly rentals for Frame Relay circuits have not been tabulated because of the number of different combinations available.

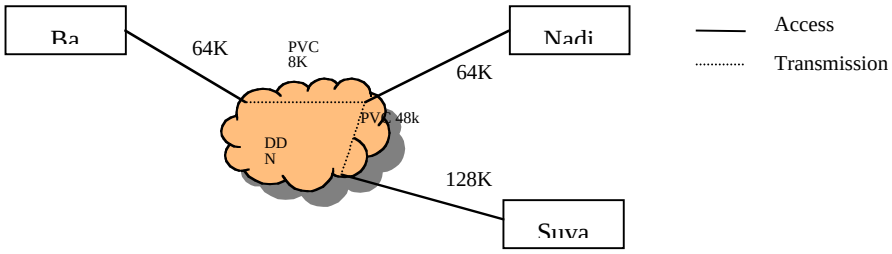
Section 3 – Examples of Calculating Monthly Rentals

1. The monthly rental for a 9.6k private leased circuit between Ba and Nadi is calculated as follows:



2 Access Points @ $180	=$360
Transmission Step B	=$150
Total Monthly Rental	=$510

2. The monthly rental for a Frame Relay circuit connecting Suva, Nadi and Ba as shown below is calculated as follows:



3 Access Points to Suva DDN	= $285 +$285 +$420
Transmission Step B and C	= $283 + $1,507
Total Monthly Rental	= $2780

Section 4 - Other Rental Changes

The table below illustrates charges for 'dropping' of links at a site and for usage of the 2nd port of a DTU.

Description	Monthly Charge
Multi drop Slave 9.6k	$ 55
Rental DataLink 9.6k 2nd port	$ 70
Rental DataLink 19.2k 2nd port	$ 80
Rental DataLink 48k 2nd port	$ 90
Rental DataLink 64k 2nd port	$100
Rental DataLink v.35 Interface	$ 35
Rental DataLink v.24 Interface	$ 35

Section 5 - Terms and Conditions

1. The amended tariffs in this brochure are effective for all new circuits ordered from June 1st 2000.
2. All charges are VAT Exclusive and in Fijian Dollars.
3. Rental period is one calendar month.
4. Standard installation provisioning period is 20 working days from date of order.
5. Telecom Fiji reserves the right to change prices without prior notice.

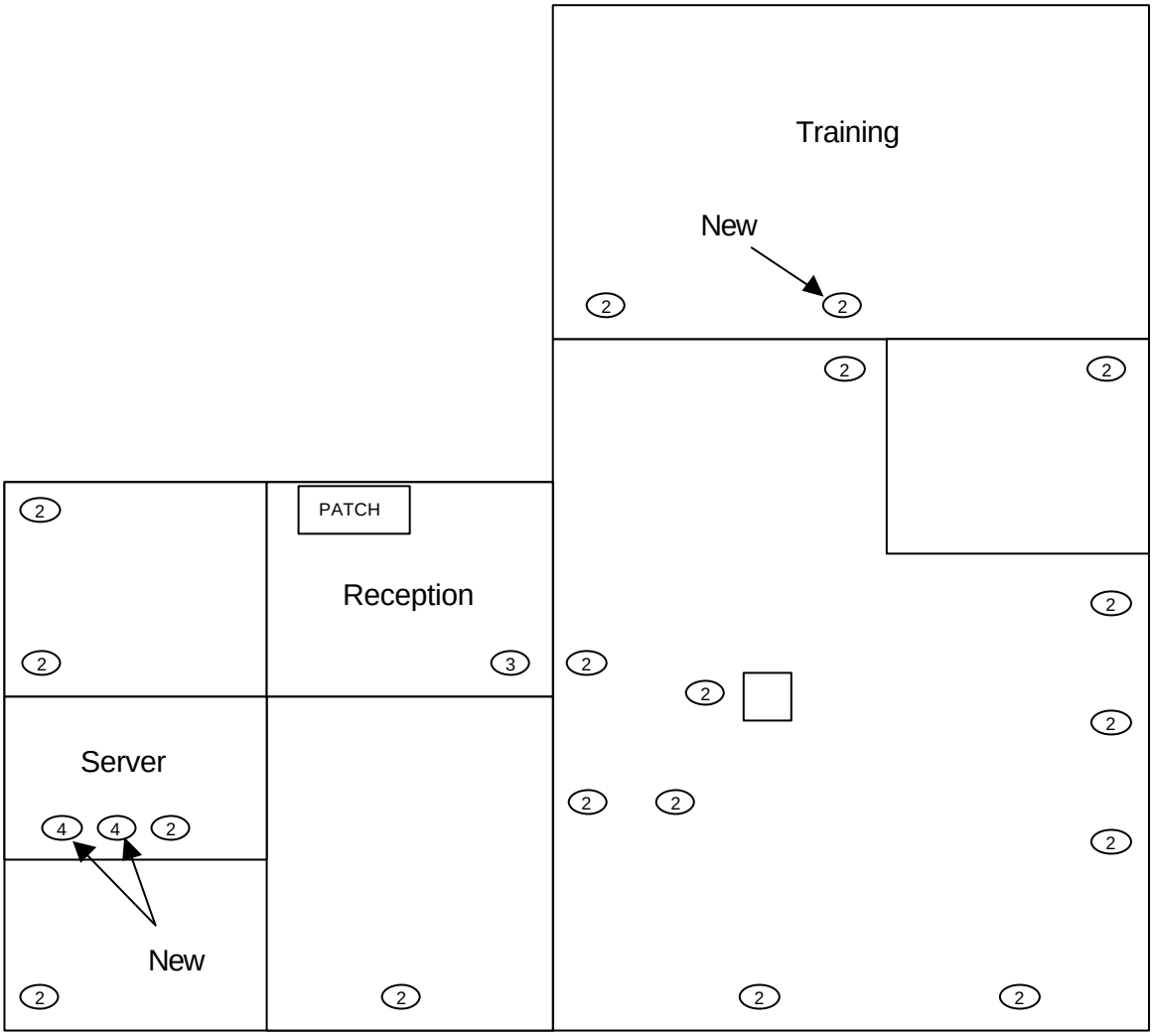
ATTACHMENT D – NETWORK DIAGRAM

The following diagram shows a schematic floor plan of the RRRT office that has been wired with structured cabling that terminates in the Patch Panel located adjacent to the new PABX in the Reception area. The structured cabling, PABX and handsets recently installed by TFL distribute voice and data throughout the office. The outlets are mostly dual with one for voice and the other for data.

The twin outlets are indicated by 2 while the outlet indicated by 3 in the Reception area provides voice, fax and data. The new outlets indicated by 4, together with the one indicated by 2 in the Server area will provide one PABX voice and 5 data circuits plus 4 external voice circuits for Internet dial-in and dial-out.

The new outlet in the Training area will address future data needs in that room.

There are 37 of the 48 ports in the Patch Panel currently wired and the additional 2 x 4 outlets and 1 x 2 outlet will utilise all but one of the remaining unused 11 ports.



ATTACHMENT E – SUPPLIER CONTACTS

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ATTACHMENT F – ACRONYMNS

DFID	Department for International Development
ICT	Information and Communication Technologies
ISA	Internet Security and Acceleration (replacement for MS Proxy)
PABX	Private Area Branch Exchange
RAS	Remote Access Service
RRRT	Regional Rights Resource Team
SBS	Small Business Suite
SOPAC	South Pacific Applied Geoscience Commission
TFL	Telecom Fiji Ltd
TOR	Terms of Reference
UNDP	United Nations Development Programme

END OF DOCUMENT